Worldviews

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Preface

The authors offer the following text to the public both realistically and with hope. Within the scientific world, large-scale movements tending towards unification seem powerless confronted with the information explosion of research and historicism in the philosophy of science. Outside of science, we notice also that both religious and secular ideologies claiming to energize mass movements have collapsed. Far be it from us to promote new, sophisticated versions of what is lost. We believe however that, within the scientific community, isolated problem solvers are looking for more fundamental contexts for research, and that many can offer insight into more fundamental questions. The Santa Fé Institute, the many attempts to organise interdisciplinary courses with human relevance, the intensity of research in cosmology and many other efforts all show this need. Outside of science, sociologists seem to agree that the informed public feels intellectually, ethically and politically lost. These facts encourage us to make a new attempt towards integration. We would like it to be careful and prudent, integrating and non-dogmatic, relevant and responsible. This has led us to write out a short 'proposal,' a kind of methodology for world-view construction, followed by a series of possible 'projects.' We realize that we need many, many years for this — in principle — unending quest. We also realize that we need many persons having different capabilities and yet sharing an identical commitment. This small monograph is not an exposition of new facts or theories, but an invitation to look at known facts and theories from another point of view, with new, different, integrating purpose. We would like the monograph to serve as an invitation to join our effort and to create, together with us, a small — but hopefully dedicated —

international forum that may generate a multiplicity of provisional and evolving world views, allowing ultimately the continuation of growth and the synthesis of fact and value, of explanation and meaning to be realized.

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PART I

I - Introduction

The fragmentation of our world

We can find our way in our own house. We know how many rooms it has, and how they are used. Knowing one's house thoroughly makes one feel 'at home.'

The world around us can be construed as a huge 'house' that we share with other humans, as well as with animals and plants. It is in this world that we exist, fulfiling our tasks, enjoying things, developing social relations, creating a family. In short, we live in this world. We thus have a deep human need to know and to trust it, to be emotionally involved in it. Many of us, however, experience an increasing feeling of alienation. Even though, with the expansion of society, virtually the entire surface of the planet has become a part of our house, often we do not feel 'at home' in that house. With the rapid and spontaneous changes of the past decades, so many new wings and rooms have been constructed or rearranged that we have lost familiarity with our house. We often have the impression that what remains of the world is a collection of isolated fragments, without any structure and coherence. Our personal 'everyday' world seems unable to harmonise itself with the global world of society, history and cosmos.

It is our conviction that the time has come to make a conscious effort towards the construction of global world views, in order to overcome this situation of fragmentation. There are many reasons why we believe in the benefit of such an enterprise, and in the following pages we shall attempt to make some of them clear.

The project of consciously constructing a world view is indeed an urgent one, since most of the macro-problems and

micro-problems of our present time are directly or indirectly related to this situation of fragmentation. It is precisely because we lack such global views of the world that our ability even to start looking for lasting solutions to these problems is limited. We can illustrate the relationship of world views to the current problems facing humanity with two examples.

First, there is the North-South conflict, which is one of the major macro-problems of our time. Opinions of individuals and groups on this problem are quite divergent. Questions of how to evaluate the level of development of a society, as well as differing visions of possible interactive mechanisms among societies, play crucial roles in the analysis of this situation. Let us briefly and provisionally examine some of these conflicting views, so we can see just how such seemingly practical issues are effectively connected to profound questions of a global nature. We will consider two sets of opposite views (views A and B, and views 1 and 2), each connected to very different world views.

According to view A, interactions between societies have a destabilising and degrading effect. This view would have people strive towards a collection of relatively stable but isolated societies. View B, to the contrary, identifies interactions among societies as enriching and deepening. It therefore aims at a situation of actively interacting societies.

Views A and B are intersected by views 1 and 2. View 1 sees the development of societies as mainly characterised by the amount of material and economic prosperity (i.e. the 'standard of living'). Social and cultural developments are believed to be the consequences of this prosperity. According to this view, the North-South problem is a confrontation between less-developed and more-developed societies. According to view 2, on the other hand, the social and cultural development of a society is determinative of its material and economic prosperity. Here the classification of the 'levels of development' of North and South is not as obvious.

Variations and combinations of 'views' are possible. Combining view A and view 1 (view A1) would, for example, call for a greater material and economic buffer between the 'less

developed third world' and the 'more developed first world.' This would require protectionist measures, and the restriction and manipulation of immigration. Cultural exchanges (tourism, sports, art), however, are not identified as threatening. Views A2 would see a need for greater cultural isolation between North and South, while economic interaction would still be allowed. View B1 would seek more intense economic interaction between North and South, with an eventual unification of economies. The economic model of the North would be the model for this interaction and unification. View B2 would strive towards a greater cultural interaction between North and South, and eventually towards a complete cultural integration. But neither North nor South would be the model, since neither could be considered to be more developed culturally. Cultural interaction is considered to be an inspiration for a society at large and hence for material and economic prosperity.

It is clear that each of these possible views will lead to different strategies of action. The political consequences for international institutions, such as migration-policy and development-aid are obvious. Although the problem of the North-South conflict seems most practical, the action generated in search of a solution will depend on a whole array of even more fundamental theoretical questions. What is the significance of our species in the evolution of life? What is the special role and nature of the human species? What are sub-species? These questions cannot be addressed properly without a knowledge of the mechanisms at the origin of the formation of species. Which properties are inherited and which are related to economic, social and cultural aspects of the societies? The search for an answer to this type of question points to the need for knowledge about the molecular structure of the gnome. In what sense are different types of economic, social and cultural organisation of societies related to prosperity, and how are they connected to more global views about the organisation of societies? Is the development of a society directly related to the realisation and becoming of the human species, or is ecological stability the major component?

We will not elaborate on these questions here. Our intent is to illustrate the relevance of world views to present human problems. This seems sufficient to enable us to conclude that one needs a frame of reference that allows, not only the relationship of one to the other, but also to see the interconnection of problems that arise in relation to international, inter-economic and inter-cultural relations. These problems range from the world population explosion to evolution and molecular biology; they involve views of the nature and the role of man. These frames of reference are world views. They offer a model that allows us to coordinate different aspects of the world in a meaningful way.

Our day-to-day personal life is also connected to society, history, cosmos and to reality as a whole. Many of us have difficulty feeling at home in our own body and mind. Science has caused a revolution in medicine; many diseases that formerly were fatal can now be treated with success. And yet there is also the strange phenomenon that almost 60% of the people in our society who feel sick have complaints not originating from an explicit physical illness. One thus encounters the concept of 'psychosomatic disorder.' But we know that although medicine cannot find the cause of their complaints, these people are really ill. Hence in medical science 'illness' has taken on another meaning, besides the direct one, coinciding with the experience of the patient. Introducing the concept 'psychosomatic disorder,' one refers to psychology and the connection between the physical and psychological aspects of man. But there still does not exist a globally accepted model for this relation.

The 'psychosomatic patient' contributes equally to the public health system and hence also expects to be helped. For this system, however, illness is something entirely different, appearing under such forms as numbers that refer to absenteeism, the use of medicines and hospital expenses. Illness is evaluated starting from a preoccupation with the ever rising expenses for the state and its attempts at economising.

The worlds of medical science, psychology, the economy of health-care service and the personal experience of the patient

lead to different and sometimes incompatible definitions of essential concepts such as illness and health. At the same time, all these approximations operate in the same world. Hence this fragmentation and loss of meaning touches our world as well as our own personal life .

The group 'Worldviews' is designed to overcome this process of fragmentation. We certainly do not want to renounce the complexity of the modern world, but we would like to search for new means of integration. As scientists from diverse origins — scientific as well as ideological — we want to explore the contemporary situation of world views and help to construct an adequate view of our world. Global world views are like geographic maps, which help us find our way and act coherently in this world. We hope that in the long run the project of world-view construction can contribute to a more integrated praxis.

The construction of world views is not an easy enterprise. Indeed the fragmentation of our present world has deep structural causes that are ultimately related to the turbulent processes of modernisation that society has known during the past centuries.

There is today an unmistakable trend towards pluralisation of culture and individualisation of human behaviour. Instead of one view of the whole, shared by the members of a bounded collectivity, there now exist in our international world very divergent and competitive conceptions and life styles. We do not interact with one culture, but with many cultures, and even with subcultures and fragments of cultures. The individual is forced to select his or her own future life, having to choose between the enormous number of possibilities offered.

A second cause of the loss of direction originates from the growing gap between the specialist and the lay person. The rapid development and enormous growth of the sciences, and constant changes in cultural life and in the arts make it impossible for the lay person to keep up. One cannot be a specialist in all domains, and what penetrates into the popular culture from the sciences and the arts is often completely alienated from the specialists' practice.

Such a gap exists not only between the specialist and the public, but even within the sciences, as the trend towards specialisation in disciplines and sub-disciplines continues to accelerate. The contact between exact sciences and human sciences is scarce and occasional. In recent years, even within isolated disciplines, new boundaries have been created, for example between macro and microbiology, and between macro and micro-economics. In its rapid evolution, science loses the capacity to generate a global view.

World views, as related to the sciences, ethics, arts, politics and religions, are integral parts of all cultures. They have a strongly motivating and inspiring function. A socially shared view of the whole gives a culture a sense of direction, confidence and self-esteem. Moreover, interactions between cultures change constantly. A culture can, for example, be on the verge of entering a technological period, while some forces within it will try to conserve its proper values. The problem of world views is thus connected to the many attempts at constructing a new coherence between cultural fragments that are constantly emerging and interacting. We believe that it is the task of our time to search for world views in which different systems of interpretation and ideals can be incorporated and can converse with each other. This task is urgent, not only for the multi-cultural societies now found in all major cities of the world, but also for those countries in which a variety of cultural patterns, with quite different histories, are striving towards a certain symbiosis.

From this survey of the forces that stimulate the fragmentation of our knowledge and of the world the difficulty of the task of world view construction emerges. The ultimate goal may not be to simply try to erase any variety of views. The pluralisation of our culture, the depth of the sciences and the arts achieved by specialists and specialisation are worthy accomplishments of our culture. We believe, however, that the fragmentation of our culture should be a starting point for a new effort at integration, one that explicitly takes into account these achievements. It is for this reason that the boundaries that have grown between the different isolated fragments must be

removed and a new communication among these diverse specialisations must be created. The immense house that our world has become, in which many have lost their way, while others have concentrated so hard on the elaborate construction of just one of its many rooms, needs to be rebuilt and rearranged. We need to make new doors, and create a house where we all can feel at home.

What is a world view? A first exploration

We must first clarify what we mean by world and world view, and specify the role of a world view in a culture. We shall first introduce the basic concepts of 'world' and 'world view,' which we will explore later at greater length.

The world

'The world' is the broadest environment that is cognitively, practically and emotionally relevant. We thus talk about 'the world' in which we live, the 'Lebenswelt' (Edmund Husserl). This 'world' can differ, depending on the culture that we consider. Therefore we can speak of 'the world of Antiquity,' or 'the world of the Eskimos.' 'The world' should not be identified with 'the earth,' nor with 'the cosmos,' nor with 'the observable universe,' but with the totality in which we live and to which we can relate ourselves in a meaningful way.

World views

A world view is a coherent collection of concepts and theorems that must allow us to construct a global image of the world, and in this way to understand as many elements of our experience as possible.

Societies, as well as individuals, have always contemplated deep questions relating to their being and becoming, and to the

being and becoming of the world. The configuration of answers to these questions forms their world view. Research on world views, although we are convinced of its practical value and necessity, will always be primarily an expression of a theoretical interest. It reflects the unlimited openness of the human mind to reality as a whole. Even if this research would not appear to be of any immediate value or necessity — quod non — we still should promote and encourage it energetically, because it also expresses the most unselfish striving of humanity 'the desire to know,' a property of 'Homo sapiens sapiens.' Hence, a world view is a system of co-ordinates or a frame of reference in which everything presented to us by our diverse experiences can be placed. It is a symbolic system of representation that allows us to integrate everything we know about the world and ourselves into a global picture, one that illuminates reality as it is presented to us within a certain culture.

World-view construction

World-view construction consists of the attempt to develop world views that take into account as much as possible all aspects of our experience. Although this construction expresses itself in a language that includes intrinsic limitations — languages are not closed formations and symbolic systems can be combined — these inherent constraints need not condemn our enterprise. World-view construction is always connected to a culture in which 'meanings' are circulated, types of behaviour are passed from generation to generation, socio-political problems are produced, and styles of art confront us. The material used to construct a world view comes from our inner experience and our practical dealings with things, as well as from the interpretation of history and of scientific knowledge about our world. All these aspects are necessarily related to particular cultures, which are not monolithic entities, but which are always in a process of change. In this sense world views are not fixed images or copies of the world, but will somehow try to capture, as much as is possible, all the aspects of this world.

Therefore new world views often start with the views of small groups or sub-cultures, and prepare, step by step, new concepts of reality. They are not just a reflection of 'what everybody thinks.'

World-view construction, as we see it, consciously aims at collective work that is not identifiable with one person. It groups specialists of divergent disciplines, and aspires to ultimately express itself in forms that can reach a large public. In this sense, world-view construction inevitably has a collective dimension.

Aspects of world views

The main properties of a world view are 'coherence' and 'fidelity to experience.' Because of the rational demand for coherence, a world view should be a consistent whole of concepts, axioms, theorems and metaphors which do not exclude each other but which can be thought together. A world view can only be faithful to experience if it does not contradict known experimental facts. Of course, what is to be considered as fact is not a simple matter. A 'fact' for one generation is merely a 'theory' for another and sometimes even a scandal (e.g. evolution theory). Scientific consensus continually evolves.

Although a world view must be much larger than all that the physical sciences can offer us, the knowledge acquired in a systematic and methodological way by these sciences is of great importance, especially in the light of the widespread consensus that exists for this knowledge. The human and social sciences continuously provide us with a deeper insight into the nature of man and society. A world view cannot contradict known experimental facts, but this does not mean that it coincides with them. A world view may even inspire further development of science and if necessary, from a synthetic vantage point, criticise certain one-sided aspects of it. In this sense a world view is a continuation of what the sciences pass on to us, sometimes coinciding with it, sometimes generalising from it, and sometimes critically rejecting it. The contribution of scien-

tific knowledge and the continuous critical evaluation of it are of great importance. Every scientific theory, no matter how well it describes and explains facts in its own domain, will always be confronted with problems that cannot be solved in the theory. Therefore, a fortiori, a world view will always be a fragile system.

A world view, however, cannot be determined by its relation to the sciences alone. Our experience also contains our different systems of meaning. In our world view, we also want to be faithful to these other aspects of our experience as we attempt possible explanations of our world. A world view must allow us to 'understand' as many aspects of the world as possible.

Our experience also includes our different systems of values. Even if these systems are often ambivalent and contradictory, we want our world view to be faithful to them. Since evaluation is seen to be more subjective, and hence connected to a particular person inside a particular culture, it will be difficult to achieve one global world view, satisfying the needs for coherent evaluation of the world for everyone. Not only scientific experience, but also aesthetic and ethical sensitivity will have a deep influence on our attempts at world-view construction. It does not follow from this, however, that world views will be simply a question of taste and feeling. Arts, styles, customs and moral codes can be very diverse, but even then they are all interconnected within their culture, and on a larger scale within the whole world in which they interact.

Every experience leads towards action of the one having the experience. It is by means of these actions that we can influence the world, and strive for certain ends. A world view should contain an organised concept of our real and possible actions in this world. Only then will it be faithful to the complete experience of humanity. Political praxis, with its many attempts to construct a new society, must also be included in a global world view. Every world view will therefore necessarily contain ideological elements.

The experience of science with its plurality of disciplines, the experience of ethics with its plurality of ethical systems, the experience in aesthetics with its plurality of arts and styles,

the experience of politics with its plurality of attempts to construct new societies: all this has a profound influence on world views. But conversely, these different types of experiences will in turn be influenced by the global world view into which they are incorporated. One of the essential functions of world-view construction is to generate this interaction consciously and in a controlled way. As a consequence, a world view can relate the different domains of experience, so that they are liberated from their isolation and become parts of the whole. The goal is to make the communication between the different layers of our experience explicit. Otherwise, if extensive elements remain unconscious, there is a danger that one aspect will emerge as the view of the whole.

Each human is part of a whole larger than one self. Both philosophy and religion have reflected on this awareness, and on the final nature of reality as a whole. Such ultimate questions cannot be avoided in the process of world-view construction. Indeed, they form the driving force behind the religious, philosophical, ethical, aesthetic and political quest of humanity. But unique solutions are not possible in this domain. Religions, differentiated internally and externally, generally emphasise the necessity of personal conversion or inner transformation, and usually rely on the experiences of a founder. In this respect, faithfulness to tradition is important for most religions. Here world-view construction differs from religion in that it shows a fundamental openness towards different interpretative models of reality, allowing agnosticism and a higher degree of uncertainty. World-view construction searches for different models to illuminate the varied world in which we live, and must therefore take into account the multiformity of the religions, even those that are neither ecclesiastical nor theistic.

Why world views?

The greater unification of humanity and the interaction between cultures, with the expansion of science and the increase of our technical capabilities, mean that our 'life

plans' are more and more determined by our relations to larger groups. We are confronted cognitively and emotionally with the whole universe, and with questions about the role of humanity in this greater whole. Ecological problems related to the survival of humanity on this planet have more and more become the concern of everyone. And yet, it has become increasingly difficult to elaborate a life plan, because it is very difficult to take into account the complexity of this whole.

Nevertheless, it is possible to think coherently and to behave responsibly only if we consider the different regions to which we belong, and their interactions. To gain insight into ourselves and our needs, purposes and values, we construct images or models of our physical and social environment and of ourselves as acting, thinking and feeling beings. We need to build such implicit or explicit models of humans, of history, of our value patterns and action strategies, and confront them with our knowledge about the cosmos and the earth, our biosphere. Without any form of integration, responsible action seems to be impossible. Since we cannot just let things go their own way (even if little can be changed), but must accept responsibility for our own world, a new effort at integrating these elements is necessary, an effort that is collective, co-ordinated and conscious. Such integration can also give a new dimension to our emotional, aesthetic and religious connection with the whole.

World views and the problem of modernism

The construction of a rational view of the cosmos and the 'polis' is often identified with the ideal of Modernism. 'Sapere aude,' dare to trust your own knowledge, was the motto that, according to Kant, characterised the Enlightenment. Modernism often means, in this context, an attempt to introduce a global reorganisation of human knowledge, human activities and human society, on the basis of human insight. But the ideal of the Enlightenment has, for many, proven itself internally

contradictory (Max Horkheimer and Theodor Adorno's 'Dialektik der Aufklärung', 1947).

Must we consider the inheritance of Modernism, the Enlightenment and Romanticism as an unreachable illusion? Our opinion is that Modernism cannot be surpassed simply by neglecting its ideals, as a certain interpretation of Post-modernism would have us believe. The result would be an evolution towards a completely fragmented world, without any sense of direction and purpose. To the contrary, we believe that the ideal of a free and rational humanity is not dead, but has not yet been realised. The knowledge of humanity and nature, history and society, the knowledge that enlightens ethical and political choices and allows us to take our fate in our own hands, is not an illusion or failure of the past, but a goal for the future. Only with this orientation can we take full responsibility and overcome at least a part of our alienation. The emotion and passion expressed in Romanticism and Surrealism, have come to be feared because of certain excesses, and in the 19th and 20th century they have been too much a part of national and social conflicts. But it is our opinion that the belief of Romanticism in personal emotion, passion and imagination as being capable of making the human person a true creator, must not be dismissed as pure illusion.

The relation between 'intellect' and 'reason' (Vernunft) as well must not be dismissed, in our opinion. In French, one makes the distinction between 'le rationel' and 'le raisonable': not all that is rational is reasonable. In the construction of a contemporary world view, elements of earlier views and their aspects of intuition, emotion and imagination will have to be present.

In this respect, we must also explain our position in relation to Scientism and Anthropocentrism. Scientism suggests that the positive natural sciences provide the only model of explanation. Anthropocentrism wrongly takes humans as the centre and only purpose of the cosmos. In the past, world views have been primarily 'cosmocentric,' starting with the birth of philosophy in Ionia in the 6th century before Christ, a bias still present in many non-western cultures. Since the 'anthropocen-

tric turn' of the Renaissance, the Humanists and Descartes, a rather explicit form of anthropocentrism has dominated Western culture. One can rightly ascertain a 'discovery of subjectivity' here. But through the evolution of our knowledge in the physical sciences and in the human sciences, we have come to see that humanity can only be understood as part of a larger whole. Scientism and Anthropocentrism, in their extreme forms, are unacceptable. We can, however, agree with Scientism when it claims that the many scientific methods deliver models of explanation that have to be taken into account in any holistic modern world view. And from the Humanist tradition we can learn how to interpret texts and other cultural products.

In constructing modern world views, we must take into consideration the Post-modern critique of the myths of race, nation and class that have too often been used as a means of repression. Our own approach is Post-modern in that we recognise that reason itself has discovered its limitations, and has become conscious of its historicity. Perfect certainty and a de facto complete and universal all-encompassing knowledge is in principle impossible. Critical reason and emotional enthusiasm need not exclude each other, and both can provide an irreducible contribution to the construction of world views. Indeed, our reason is limited and our emotions can be misled. We must also confront the shortcomings of language. Thus, we have learned to appreciate variety and multiformity as values, and hence we do not want to strive for one unique world view. But neither do we want to resign ourselves to the present situation of fragmentation.

We therefore situate ourselves in the difficult but necessary tension between Modernism and Post modernism, Scientism and Anthropocentrism, Enlightenment and Romanticism, secularism and religion, philosophy and science, the individual and the collective, western and non-western culture.

World views grow organically and historically. But, on the other hand, they need to be articulated, understood, and developed. In what follows, we will attempt to put forward a set of ideas that can serve as a starting point for such an elaboration.

II - The Seven Components of a world view

The following seven questions represent, in our opinion, basic elements that must be accounted for in every world view.

1. What is the nature of our world? How is it structured and how does it function?
2. Why is our world the way it is, and not different? Why are we the way we are, and not different? What kind of global explanatory principles can we put forward?
3. Why do we feel the way we feel in this world, and how do we assess global reality, and the role of our species in it?
4. How are we to act and to create in this world? How, in what different ways, can we influence the world and transform it? What are the general principles by which we should organise our actions?
5. What future is open to us and our species in this world? By what criteria are we to select these possible futures?
6. How are we to construct our image of this world in such a way that we can come up with answers to (1), (2), and (3)?
7. What are some of the partial answers that we can propose to these questions?

These seven questions articulate different sub -tasks that are entangled with and necessitate each other. Answers to them can only be satisfactory if they form a coherent whole. We will demonstrate how and why this is the case in the next part of this text. While there is no hierarchical relationship among the different sub-tasks, they clearly come together in one unified view.

World-view construction must not be seen as an arbitrary projection. The word 'projection' itself calls to mind the work of the cartographers of antiquity and the Middle Ages, who indeed were involved in a sort of construction of world views.

They constructed maps of the world using the data coming from navigators, merchants and explorers. Even though this information was often incomplete, imprecise, contradictory or even invented, it was gradually adjusted and shaped into a coherent image. The construction of these maps even helped introduce new values and initiated new activities and exploration.

In this final decade of the 20th century, we have an enormous amount of information at our disposal. On the one hand, this makes it easier for us to form an image of the world in which we live, but on the other hand this introduces a new type of difficulty, i.e. we must develop the ability to take into account all this information. Indeed, the integration of all this data poses an enormous problem. In connection with this problem we must consider the seven sub-tasks mentioned above.

A model for the world in which we live

In our search for a world model, we intend to use concepts such as 'world,' 'nature,' and 'universe' in the most general way possible. We mean something like this: 'the totality of all that exists, and with which we are confronted in one way or another.' We can approach the 'world' from the point of view of the subject and its interests. Or we can approach it as an objective entity that shows itself to us, asking ourselves how it is constituted and how it works.

Description as such is already a choice for a certain model, which entails the representation of reality by means of a symbolic system of concepts, emphasising certain elements and relationships. 'To describe' involves the selection of certain differences. Whether something does in fact make a difference depends on the interpretation of an observer. It also depends on the relation between the observer and the instrument used for the observation. The human eye, for example, is only sensitive to a certain range of the spectrum of light. Hence, it is important to know what differences will be considered in any description. The colour of a rocket, for example, is not important in the description of its trajectory, but it may be relevant in its identification. This illustrates why it is necessary to make descriptive models on different levels (micro-models, macro-models), and why the nature of a descriptive model will often be determined by the purpose one has in mind: utility in relation to directed action, intelligibility, etc. That the observer does influence the observation does not imply that he or she creates the observed. Models are not mere subjective constructions. But we will encounter, in many forms, a tension between objective and subjective elements (realism versus idealism) in our project of world-view construction.

The explanatory power of a world view

No matter how important facts may be, we are not satisfied with merely 'knowing' them. We also want to 'understand,' gain 'insight' into and explain them. We always seek an answer to the question 'why?' No consensus exists concerning what constitutes 'understanding' and 'explanation.' This comes, in part, from the fact that explanation has a different meaning in each sub-region. To construct a world view, we will have to experiment with different models of 'understanding' and 'explanation.' We will also have to give a new meaning to the 'why' question as applied to the world as a whole, one that cannot be the same as in the different sub-regions. Explaining often means formulating meaningful connections. However, if the object is reality as a whole, the 'why' question cannot retain the same meaning. 'Being' in its totality, according to both mystics and philosophers, must find its roots in itself, or it is 'rootless.' Concerning individual realities, the question indeed arises: why are they there, and why are they as they are? Why, *überhaupt* is there something rather than nothing?

Contingency and historicity are important aspects of the reality around us. And yet, we seem to live in a universe that is governed by laws. The question thus arises as to the explanation of these laws. But without initial conditions these laws cannot be applied. This indicates that we must also search for

the explanation of the initial states from which, under the influence of the laws of evolution, the history of the universe, life and humanity have developed. Some see laws as primary, others see history as more important, while still others see laws and history as existing independent of each other. For thinkers like Spinoza, Leibniz and Einstein, chance, contingency and historicity are not of importance, while for other thinkers they are. The absence of agreement on this matter stimulates further research. Understanding most obviously means: getting a grip on a wider coherence, or, grasping the general in the specific. 'Comprendre, c'est prendre ensemble.' Hence a world view will have more explanatory power if it can grasp the most general structures and laws that exist in reality. There are many opinions on the meaning of explanation. Explanation can have a minimal and a maximal meaning. Minimally, it means situating the phenomena in a network of relations. Explaining can also mean the construction of a causal model for the chain of phenomena (if... then...). Or it can seek to clarify the origin and genesis of a phenomenon. It can also mean the grasping of the most general form of the phenomena in a comprehensive 'Gestalt.' In its maximal sense, explanation can mean showing that the phenomena cannot be different from what they are. According to Leibniz, this entails that all propositions are analytic. This seems to us a too narrow view of explanation. Indeed, contingency and historicity are overemphasised in our present day sensitivity. Nevertheless, explanation will always be related to the discovery of a connection between what presents itself in a description and the general explanatory principles from which we start.

A scientific explanation looks for the 'why' of the phenomena. In one way or another we need to bring a phenomenon back to its antecedents, and to construct a reasoning in the form of 'if A, then B.' For instance, if gravitational force has a particular value, then the acceleration with which material objects fall will be such. Description exposes the elements involved, and the connection to initial conditions gives us insight into the coherence between the elements of the description. 'If..., then...' can, however, have different meanings. Whether an

explanation is satisfactory depends on whether the one hearing the explanation is satisfied with the elements taken as postulates. Thus, in practice, explanation often comes to mean the derivation of less evident facts from very general postulates, laws and patterns. There may be an attempt to express these postulates and basic principles systematically, but they themselves remain unexplained. Moreover, we know that every axiomatic system is incomplete, and will hence provide an explanation only to a certain point. Therefore, the human mind will always keep looking for deeper explanations, as exhibited, for example, by Plato and Spinoza. Every language points to a more general meta-language. Ideally, such a system of general principles would allow us (1) to derive the laws that govern our world, (2) to stipulate the initial conditions of the birth and evolution of our universe and of the life that has developed in it, (3) to derive the tendencies of the history of the universe and of the evolution that takes place in it. It is clear that such an ideal can only be reached in a process of approximation (asymptotically).

The fundamental impossibility of a complete explanation has caused some to refuse any attempt at explanation. This attitude amounts to a rejection of reason itself and leaves our deep need for insight completely unsatisfied. The selection and critique of general basic principles, basic laws and postulates must thus also be one of the main objectives of world-view construction.

World views and evaluation

We do not live in a 'neutral' world. We admire, love or value certain aspects of the world, while we detest and hate others or find them irrelevant. We enjoy, and we suffer. Some aspects of reality are holy, others profane. A world view does not only make reality intelligible, but also provides a means of evaluating this reality, as it is expressed in different cultures. As we have noted above, it is difficult to arrive at a consensus about the meaning of 'explanation.' It is even more so with regard to the process of evaluation. We believe, however, that everyone

who wants to construct a reasonable view of reality and human existence will have to take into account the following questions:

1. What is happiness and suffering for feeling and/or conscious beings? What increases or decreases happiness and suffering?
2. What is the meaning and the function of aesthetic experience? What is beauty and ugliness? How can these categories be applied to the physical, biological, social and psychological world? Can they be applied to the world as a whole?
3. What is the origin of the distinction between good and evil? Can these concepts be applied to different regions of reality, or are they limited to the human world? What determines the values that someone will choose in his or her personal life? What is the meaning of the distinction between the healthy and the sick, between the normal and the abnormal? Is this distinction only culturally determined? (Cultural anthropology and clinical psychology should be able to shed some light on these questions.)
4. We often compare values with each other; some values are more significant than others. It seems that values are related to the use of a norm, and perhaps to the striving towards a purpose. How does the process of 'evaluation' depend on aspirations and strivings? Is there a hierarchy of values and purposes? Should one avoid a linear ordering and consider only partial orderings? 'Value A' can be superior to 'value B,' according to certain criteria, but the order can be reversed according to different criteria.

   The relation between value and science will also be affected here. The fact that the physical sciences sometimes claim to be value-free finds its origin in the attempt to emancipate the intellect from social pressure, external authority and affective preferences, an attempt that we should praise, and that has proven to be fruitful. This attitude, however, does not imply that scientists escape responsibility for the results of their research. Sooner or later they are confronted with the problem of evaluation. Is there a responsibility for the scientist who unravels the forces of matter, when this knowledge can be used for the fabrication of arms capable of untold destruction? For example, current research in genetics will certainly have an influence on future ethical questions. We believe, generally, that the development of our factual knowledge will influence questions of evaluation in a positive way, and that many of the ethical and aesthetic concepts that are now very abstract will become more concrete through this process.
5. That individuals differ profoundly in their opinions about values does not necessarily indicate that values have a naive or pre-reflective character. Such a discrepancy can be due to the fact that the way evaluative aspects of the world are structured, heavily depends on the culture and even on the individual person. Not one aspect of human existence escapes the problem of evaluation. On the final value of human existence, opinions differ. Contact with religion is inescapable here. What is the meaning of the difference between the holy and the profane that we find in many cultures? Are certain aspects of the experiences of the holy objective?

The fact that there can be knowledge only for a knowing subject does not imply that reality is a purely subjective construction. Of course, every experience of value is intrinsically subjective, since there can only be value for a value-experiencing subject. But this does not imply that reality has no objective carriers that provide the material for this process of evaluation. The search for objective carriers will be of profound importance in the construction of a world view. Indeed, whether one gives preference to certain values or not, whether one interprets values as purely subjective or not, the question remains as to whether it is possible to say something about the world in which we exist or about the world as a totality from the perspective of the values that we hold. Ultimately this is also connected to the question of meaning: what is it that gives value to our existence in this world? What is it that makes life worth living?

These questions cannot be put aside. Whether the answers are negative/positive, or agnostic they are still answers, and they do suggest that the question of meaning makes sense. An answer to this question will be more universal, and consequently more objective, if individual systems of value can be integrated into a more global value system. For example, questions about marriage and sexuality or about parent-child relations vary greatly from one culture to another. But there are no cultures where these questions are irrelevant. A world view can neither put forward one set of values as the norm in all cases, nor consider the evaluative element of human existence as insignificant. World views will differ insofar as they structure this evaluative element of human existence differently. For example, in more primitive societies, relations with one's own group will be highly valued, while this value is hardly present in the most industrialised groups of our society.

A model of possibilities: Rational futurology

A world view seeks to clarify the place of humanity in the world and to provide insight into the most significant relations humans have with this world, both theoretically and practically. Our knowledge, however, is far from complete. Our global action in the world is at a rudimentary stage and our value patterns are insecure. The future may depend on us, but it is not possible to simply derive it from the past. Rooted as we are in a past that cannot fully be unravelled, the future for us is a tree with many potentialities. Various scenarios can be invented. Attempts to investigate these potentialities in a reasonable way have been undertaken by such writers as G. Berger, R. Ruyer and A. Toffler, and by many other futurologists, such as J. Forrestier and G. Meadows. How will cultures interact with each other in the future? Will Western culture become dominant over the whole world? What will be the role of science and economics in the future order? Who will make the decisions that will influence humanity as a whole? In the long term, and hence more speculatively, one can ponder the role of humanity

in the universe. Does humanity have a future that reaches beyond the planet earth? Will we ever be able to bring human life to other planets? Does our species have a cosmic function and destiny?

Questions about the future of humanity have (as does world-view construction) a descriptive and evaluative component: what awaits us, and what should we do? Plans for the future must be modified depending on whether they deal with the short, middle, or long term future of humanity. These distinctions make realistic, collective and effective action possible. For example, care for our environment is of a completely different order from the investigation into the eventual destruction of the earth due to continuous increase in the size of the sun. Indeed, preoccupation with the ecological problems of our immediate environment is urgent, for it presents an imperative for our collective efforts. Speculation about the future of the earth five billion years from now remains highly theoretical.

In all cultures there is an interest in questions about death. A world view should make it possible for us to relate in a meaningful way to death and the finiteness of life. Even if cultures come and go, this does not make them meaningless accidents of history. There must be human ways to cope with the consciousness of the finiteness of life, and to transcend the 'Sein zum Tode' in one way or another. For many religions, as for some secular schools of thought, attention to the future is an intrinsic element in culture (as in Ernst Bloch's 'Das Prinzip Hoffnung'). The relation between the death of the individual and the death of the group or species makes it impossible to avoid larger questions about the meaning of the human adventure in this cosmos.

No matter how uncertain the prognoses may be, and no matter how opinions about the eschatological destiny of humanity may differ, we must attempt to reflect in a reasonable way about our responsibilities towards future generations. It must be possible to reach enough of a consensus on this aspect of the future to produce or promote meaningful collective action. Reaching such a consensus is one of the aims of world-view construction.

A model for the process of model construction

The project of world-view construction requires that one takes into account subjective as well as objective elements. All knowledge, meaning and value are subjective and bound to a culture insofar as they are necessarily experienced by concrete, historically determined subjects. The nature of this situation does not imply, however, that the objective aspects of a world view are any less important. It is precisely these aspects that are at the basis of the possibility of integration. A world view is neither a mere reflection on objective reality, nor a purely subjective construction. Today, the universe can no longer be examined without taking into account the one who observes this universe. Nevertheless, we think that doubt concerning the possibility of world-view construction finds its origin to a great extent in the fact that so much attention is paid to the role of the knowing, evaluating and acting subject. As a consequence, world views are often reduced to the needs and characteristics of the subject. We reject this over-accentuation of the role of the subject because we believe the subject can also learn something about itself by regarding and studying itself from different external perspectives. The danger that the subject will be lost in this process of objectification can be overcome by an integration of the different perspectives involved.

In the process of world-view construction, the subject does indeed construct a model of reality. Our way of taking into account the presence of the subject in this process is by investigating the process of model construction externally. This requires a paradigm for the process of model construction. The cognitive aspect of this process has been studied most intensely, and we will consider the results of these many studies in our attempt to propose a general paradigm for model construction. Let us examine some of its elements.

1. The necessity for constructing a model of the surrounding reality can be related to the necessity of a living organism to adapt itself to its environment. In this sense, the problem of model construction has ethnological and ecological elements. The subject cannot be understood without a body. The 'biology of cognition' (Konrad Lorentz) explains how and why our categories are partly determined by the type of organic beings we are. We observe only certain tones and colours. Our 'measure' is neither the very big nor the very small.
2. Model construction is also a personal psychological process. Its development is investigated by genetic psychology, while differential psychology unravels its affective-dynamic aspects.
3. Model construction demands communication and language. When knowledge becomes more differentiated, a specialised professional language cannot be avoided. The study of the cognition process in scientific languages clarifies the structure and development of these languages, which influence our cognition structures and contents.
4. There exist different means of observation, which also influence the construction of theories. Scientists develop a certain style which expresses itself as a subculture. The 'ethnology of the cognition process' studies the different 'tribes' that generate these subcultures, in the same way as traditional ethnology tries to understand non-western cultures. On what does the social prestige of the scientist, and the respect for the laboratory depend? Who or what determines whether a new theory is 'scientific'? The verification of our theories is a collective process, and the process of convincing is socially determined. Group conflicts and hierarchies between different scientific groups will thus have an influence on our body of knowledge.
5. Sometimes it is possible to really understand something only if one can also construct it. The study of artificial intelligence and cybernetics in general can help us in this sense to better understand the process of model construction. Computer simulation of problem-solving programs serves as a laboratory for experimental research on the cognition process.
6. Cognition research uses few means for many aims. We need to cope with the economics of human resources, research

funds, etc. Money used for space travel cannot be used for cancer research. The economics of the 'cognition enterprise' investigates in which way these economic restrictions influence the form and content of our model.

7. Cognition is a historical process. The history of science (and its theoretical foundation, the dynamics of science) shows how knowledge evolves and determines its form and content.
8. As we remarked above, the subject cannot be excluded from the world view. This does not imply, however, that all perspectives can have an equal influence on the image of the world. It is the complete human — the individual human being as well as his belonging to a certain group — that is the subject of cognition and of model construction.

In search of an integrated action model

The world in which we are cognitively and emotionally involved is also our field of action. To act in a meaningful way and to transform the world in function of our purposes are characteristics typical of the human species. Therefore, a world view must not only contain a model of description, an explanation and an evaluation, but also an organised view of the factual and possible influences that humans can have on the world. To define such an integral pattern of action, it is necessary to bring together deeply divided disciplines, and perhaps even to use them for purposes for which they were not originally developed. There is a general tendency to neglect the applied sciences when one is looking for an insight into reality. That they are called 'applied' sciences suggests that they are expected to 'merely apply' the knowledge that has been acquired in a theoretical context. This is only partly true. The applied sciences have a very rich potential for the construction of a global world view, precisely because they are synthetic and inter-disciplinary. For example, the engineer has to organise a production process as a totality that relates purely physical processes with economic, social, psychological and ecological problems. The politician, the lawyer and the manager have to use psychological, economic and social means to organise a society, striving towards very general purposes. The physician can only achieve his or her goal if he or she, besides healing, also tries to prevent illness, paying attention to each patient as a physical, psychological and social being. This presupposes a 'holistic' medicine.

It is a fact, generally accepted, that this synthetic character of the applied sciences is not recognised as the most important one, neither in the practice nor in the training of applied scientists. The applied sciences are losing their internal unity, even if this unity is one of their foundations. Hence, there exists in this field, both intellectual and practical problems of integration, between different forms of medicine, law, engineering, etc. This situation is also intimately connected to the political, social and ethical problems of unification.

Apart from the problem of the internal unity of the different applied sciences (which, by means of their strong synthetic character, are directly related to world-view construction) the problem of their external unity also arises. If one's actions influence landscapes, animals, plants, persons and groups, one acts in function of a certain purpose. Aristotle made a distinction between theoretical thinking and practical thinking, and came to the conclusion that 'action thinking' has its own methodology (because of its urgency, heterogeneous information and cost-benefit analysis). This methodology receives too little attention in our culture. Reflection about technology — about the 'logos' of the 'technè' — is necessary. The internal unity of the applied sciences can only be realised if their external unity is also developed For example, integrated medicine or an integrated environmental policy can be attained only if physicians, politicians, and ecologists learn to take into account each other's insights and purposes. We can outline the many divergent ways in which we act on our world:

1. Humans act on physical nature. Engineering specialises in this field (the construction of power plants, roads, etc.).
2. Humans continuously interact with the living world, influencing plants, animals, other humans and biotopes. Agrono-

my, medicine (human and veterinary), and ecology specialise in these fields.

3. Humans relate themselves to other persons and strive towards a certain state of well-being. Psychology, psychiatry (individual and social) and pedagogy study this field.
4. As a social being, the human person relates to groups and is thus influenced by others and also influences others. Political science, 'social engineering,' political economics, jurisprudence, and criminology can help to control and regulate this power struggle. Social criticism can also play an important role in this domain. Artists should also contribute and search for new possibilities here.

The disciplines mentioned above do not have a monopoly on the insight and experience that humanity has acquired in these areas. They generally keep their own implicit prejudices and values hidden. So-called 'skilled labour' is based to a great extent on non-explicit and unknown principles of efficient action. What is valid in one situation is not necessarily so in another. For example, does it make sense to introduce sophisticated agricultural techniques in countries that are technologically undeveloped? Should a rationality of economics take into account only the principle of profit? It could indeed be possible that an economy that ignores moral criteria, ultimately turns out to be inefficient. From such reflections it becomes clear that in the field of our actions, understanding and evaluation cannot be separated. Our interaction with the world evolves continuously, and is directly related to the world view, in all its aspects, in which we participate. Acting in the world is the natural complement to the construction of a world view, and hence will be connected to the difficulties and complexities of such a construction. It is only when the different scientific disciplines and the different specialities choose to interact, and only when all cultures and states recognise that they have common interests, that humanity can evolve towards one single cooperative society.

This requires a general theory of problem solving and strategic action, as a frame of reference for all applied sciences. No priority may be given here to certain partial strategies. Both

centralising and decentralising forms of organisation, both autonomous and hierarchically-related structures will appear in various domains, and will have to be evaluated in function of their purposes and efficiency in certain concrete situations. For this, a general theory of problem solving and strategy of action is called for ('decision theory,' 'dealing with uncertainty,' 'strategic research'). We think that it is only in relation to a general praxiology that a global world view can be elaborated.

Fragments of world views as a starting point

1. At first sight, one unified world view may seem to be an ideal. But soon it becomes evident that this ideal is not easy to realise. At the same time, it may seem socially threatening to think that one can and must strive towards one unique world view. Such a view can lead to totalitarianism. We have already seen too often how different philosophical, ideological and religious systems behave as competitors. This, in any case, may be the impression that someone who has studied the history of ideas from the outside receives. Parmenides and Heraclitus seem to adhere to opposing views; materialism and idealism are opposites; theism and atheism exclude each other. Such antitheses are often a basic cause of fragmentation. We must try to discern which contradistinctions correspond to fundamental choices of humanity (resulting in fragmentation that cannot be overcome), and which are merely 'local fractures' of symmetry (which should be integrated for the benefit of humanity). But even then we must avoid naively striving towards one unique world view. We should look for a multitude of coherently connected world views with enough room for a plurality of aspects to be included in it.
2. We must realise that none of the world views of this multitude will attain completeness in one particular form. Indeed, any theory about reality as a whole is always self-referential. Such a theory certainly must contain a model of the way in which reality as a whole generates the systems

that describe and explain this reality. For example, it will have to contain a model of our brain, but also a model that describes and explains how we construct such a model of our brain. After Gödel's theorem, we know what kind of problems are incorporated in such an attempt at strict logical formalisation of a global theory.

3. Even the explicit realisation of one incomplete world view among a multitude of others is an ideal. We will be able to work step by step in the direction of such an ideal, while convinced that every step is fruitful and valuable. And of course we must strive for world views that are as complete as possible, as precise as possible, as explicit as possible, and that are without contradiction.
4. In earlier societies, the role that we now are giving to world views was fulfiled by views of totality of a religious nature, or by secularised forms of it. Today, many traditional world views are in tatters. Existing systems of orientation will have to incorporate a vast amount of new information about the nature of reality, and integrate this information in one way or another. Therefore, it should prove fruitful to investigate how world views or fragments of these views still circulate in our culture.

   Historians studying the history of changes in mentality, as well as psychologists and sociologists, indicate that vague, contradictory, implicit, and intuitive fragments of world views still exert a real influence on the way in which we live in our society. Moreover, many more people have access to alternative world views due to the influence of the mass media. An enormous number of publications, and the dissemination of information via various types of courses and workshops, are often dedicated to the interpretation of man and the world. Traces of the world view problem can be found in philosophies of life, 'Weltanschauungen', images of humanity and society, ideologies and philosophies. Some of these fragments highlight the individual, others the group; some pay attention to the world, others are anthropocentric; some are theoretical, others are practical; some are descriptive, others are normative. Polls, such as the European values-project, could be used to model the governing world view fragments. Once this model has been constructed, the question of explanation comes up: why are these world view fragments present in Western society and not in others? Why is 'respect for our fellow man' an obvious value for us while our attitude towards the non-human part of nature is so inhumane? Where do we find similarities and differences with other cultures? Is it correct to say that Western culture is engaged primarily in practical matters, while Eastern cultures pay more attention to spiritual dimensions of reality?
5. In the past, as in non-western cultures, thinkers have tried to construct explicit world views, taking into account the knowledge of reality available in their time. The history of philosophy and comparative philosophy can give us insight into all these attempts to understand and evaluate the factual world. The fragments of world views elicited are often incomplete, contradictory, vague, and not always rational. How can we evaluate from our own point of view these philosophies and segments of world views from the past? Philosophical systems of the past and present can certainly be an inspiration, since they can illuminate certain aspects of the world in which we live and in this way illuminate a multitude of answers and problems. They should be evaluated, however, on their capacity for maximal integration of the fragments. Aware of the fact that every question about world-view construction has to start from an implicit, fragmented world view that cannot be made completely explicit, we must be even more critical of attempts at striving towards a unique and absolute world view.

It is also possible to clarify factual world view fragments as echoes of 'common sense' or of insights that are valid in certain social configurations. The advance towards a maximal world view can then function as a corrective and a warning against making one of the fragments absolute (e.g. science, religion or politics). We do not thus mean to diminish the attempt to illuminate and evaluate as much as possible our own existence by considering the separate domains. It is a fact

that in the past we have been able to find inspiration even in fragmented views, in order to lessen our fears by acquiring a feeling of direction, to increase solidarity by striving towards common goals, and to gain in this way some understanding about ourselves and the world. World-view construction should aim at fulfiling all these needs in our complex society.

III – The Unity of the Seven Sub-tasks

The sub-tasks for the construction of a world view, that we mentioned earlier, form a whole. We can show this by means of an example. Let us consider the situation of a person who has to spend some time in an environment that is unknown to him. We can imagine the person to be, for example, a cultural anthropologist. To be able to orient himself in this new world he shall certainly perform some of the following acts:

1. Try to form an image of the habits and customs of his new environment.
2. Try to understand the 'how' and 'why' of the customs and habits.
3. He shall try to avoid reacting in a simple affective manner, but will construct a personal evaluation model; some of the customs he can appreciate, others he rejects.
4. He shall try to predict the evolution of the environment that he slowly starts to understand, taking into account what happens elsewhere and relying on his earlier experience. Certainly if he is also expected to act in the environment, he shall try to construct realistic goals in the best way he can.
5. After a while he shall try to estimate how much he has been able to understand his new environment. Can he talk in a meaningful way with others? Is he accepted in his new environment as a person?
6. He shall model his possible actions to come to a meaningful plan. In which activities can he participate? With which does he not agree, and why not?
7. He shall have to be ready to weigh his actions continuously against those of the others, who generally strive for other goals, in different ways.

These seven obvious tasks for someone who explores an unknown region, do not differ much from those that we have to perform to orient ourselves in our own milieu as we work on world-view construction. Nobody thinks that working consciously at these seven tasks is an exaggeration when one explores a new environment. Why then should one be amazed, and even consider it an impossible undertaking, when someone tries to orient himself on earth and in the cosmos, the 'new' environment of man? Most of the time, we live as individuals in a small geographical and social environment. Our interests are limited and we are not able to think and plan far ahead. Our 'spontaneous' world view is that of our families, our region, our group, our profession, our people, our time. Not everybody is interested in the stars. Not everybody is an animal friend. Stars and animals are not part of the world of everybody.

But we cannot avoid constructing models that take into account our sensibilities and particular interests: models of ourselve as acting, feeling and thinking beings, of our fellow humans, and of our physical and biological environment. These images of ourselves, of our group, and of our tasks, form approximately a coherent whole. They contain theoretical as well as practical aspects, and affect us aesthetically, ethically and spiritually. They determine in a certain sense what we think of ourselves. As long as the theoretical, practical and emotional aspects of our experiences are not too far apart, limited and partial perspectives are sufficient.

When humans come across other cultures, these local models turn out to be insufficient. In our actual historical situation this is what happens, and there are several reasons. The part of reality that we reach increases constantly and the depth of the involvement in our environment grows, and our action radius increases constantly. Of course, individuals and collections of individuals are the ones who act, but because of the intrinsic and fundamental nature of our actions, we engage automatically all of humanity and future generations. In this way, the acting subject becomes more and more the whole of humanity. In our actions 'we' influence the whole world, the whole of

humanity and even the universe. By means of our knowledge we relate with the whole observable universe and witness the increase of man's impact on this whole. We are confronted with a multitude of interacting value systems. The tasks that have to be undertaken to be able to orient ourselves in a meaningful way in our world, that slowly is becoming the whole universe, are more urgent than ever. As we understand that our world is not our land or Europe or the USA or another continent, but that we have to learn to live and think on a planetary scale, the urgency of a global world view will become even more obvious.

We have accentuated the way in which different aspects of the world view problem are connected. We still need to mention that each of the sub-tasks assumes and promotes the others.

He who wants to have a future-oriented global view of the history of humanity needs a world model and an action model that enable him to make reliable prognoses. For example, the explosion of the world population is clearly a problem that has ecological, political and ethical implications. How can we construct a meaningful opinion about this problem, if we do not know the capacity of the earth and the origin of this explosion? One who seeks a world explanation needs a world description. A global world model is impossible without a place for man, who knows, acts and evaluates. And as we remarked already, the acting subject becomes more and more the whole of humanity. Every evaluation for the sake of action implies a knowledge of the present situation. A global action model presupposes a world model, and it also needs a model of the instruments, materials and possibilities. For example, can a project to populate other planets as a possible solution for the population explosion be taken seriously or is it pure speculation? Constantly one needs a confrontation between new insights and traditional models of interpretation. For example, are we sure that chemical agriculture and even chemical medicine solve more problems than they will eventually create?

From the comparison of the obvious tasks of a cultural anthropologist with the tasks awaiting us in a global develop-

ment of world views, it is evident that the defined sub-tasks follow naturally from our situation in this world and that they are connected intrinsically.

IV - Metaphors and Models: The Language of a world view

Expressions such as 'the layers of society,' 'the ravages of time' and 'the machine of the state' attribute properties to society, time and state that they do not really posses. Even so this 'false' information clarifies the concepts of society, time and state. These non-literal associations of concepts that force the reader to see real and true relationships, are called metaphors. A metaphor gives us a means of reaching new insights and ideas starting from known concepts or objects that we can represent easily. Our 'world-view construction' itself contains a double metaphor. Our result will not be a view (as of a landscape) and we don't construct (as an architect does). We could have chosen other metaphors to express our enterprise: 'world concept' (emphasising the reasoning aspect) or 'world picture' (emphasising the visual aspect). In any case we shall use metaphors, because language without metaphors seems to be impossible. The project of world-view construction consists in elucidating (metaphor) the whole of reality starting from certain parts. The world can be seen as a machine, an organism, or a consciousness, and the well-known figure of speech 'pars pro toto' brings forward (metaphor) essential properties of it, without being identified with it. It is impossible to construct world views without using 'root metaphors.' To see total reality as a cloud of atoms, as a field of forces, as a stream or as a substance, as a machine or as an organism, as a clock work or as a piece of art is using metaphors. A metaphor can also be dangerous because of its inspiring power. If we know however what the images mean we can use their heuristic and interpretative power without danger. They can help us grasp certain aspects of reality that we would otherwise neglect completely. Isolated and simplis-

tic metaphors, certainly when they are taken literally, are dangerous and are better avoided.

Hence, a world view always contains many metaphors. Does this imply that world-view construction will become a part of literature, a sort of 'mythopoesis,' a new mythology? The plan designed by an architect for a building, the model that a chemist makes for a molecule, the drawing that a biologist conceives of the skeleton of a species and the organigrams that a manager uses for the hierarchical structure of his enterprise are different kinds of metaphors. All symbols and models in every domain, from mathematics to lyrics, have in common that 'something is used as a representation of something else.' Our world view represents in this way the totality. It can only be expressed by means of some language that will use many different types of symbols, signs and icons.

How does the language of a world view function? The importance of these questions becomes clear if we see how many different languages will have to be translated in our integral world view We need words like 'emotion' and 'Gestalt' (otherwise the psychological aspects are ignored), but also words like 'purpose,' 'group,' and cohesion' (otherwise we miss the sociological aspects); we need 'cell', 'species', and 'evolution' (to be able to talk about living beings), 'planet', 'star' and 'galaxy' (from astronomy), 'differential equation', 'field', and 'vector' (from mathematics and theoretical physics). All these words however are part of heterogeneous languages, and this is a great difficulty in the task that we have placed before us. Some words come from formal languages and have a more or less precise meaning (the last three for example), others (the first four) have their origin in natural languages and although they have precise meaning, they are not defined in an axiomatic way.

The language that we want to use for our world view cannot be just anything. It has to incorporate verbal and mathematical segments. How can this be done? We shall have to employ translations that shall perhaps increase the precision of certain terms but decrease that of others. How is this possible? Earlier 'there have been attempts to make the language of one science (e.g. physics or psychology) into a basic language. We do not

believe this is possible. On the other hand we cannot be satisfied with the existing 'Babel' of the jargons of the different disciplines. Along with the selection of a collection of good metaphors we have to decide on an intermediate language (not too precise and not too vague) as a central aim of the enterprise.

A third question can be posed. Is it possible to simulate on a computer a complicated system such as a world view? This would make it possible to apply the method of free variation, which is very useful to be able to compare the real world with possible worlds. Then the question immediately rises of the relationship between the natural languages of a descriptive nature and formal languages used elsewhere, and the computer languages that might be used.

These three difficult and deep problems (choice of the metaphors, the intermediate language, and a computer language) shall not have a unique and optimal solution. One has to answer so many desiderata that one shall have to place partial solutions side by side. These many different solutions are not arbitrary, but are like the different types of cars, where some are faster, others last longer and others are more economical. There are also many different maps: political maps, economic maps, geological maps, etc.

Problems such as realism/antirealism in the philosophy of science, discussions about the role of the metaphor in linguistics, the debate around pluralism/relativism in cognitive science: all these questions cannot be avoided if we want to attempt the construction of world views. It is not our aim to consider these aspects in more detail here, but we want to state clearly that we are aware of the fact that we shall have to confront them.

V - The Purpose of the group 'Worldviews'

In this text we want to describe as clearly as possible the aim of world views. The world view project has at the same time both a utopic and a pragmatic character. Just because the goal cannot be fully reached it does not follow that the sub-tasks that we have put forward are not worthwhile or that we need not strive towards a greater integration of the existing partial views. Even this entails collective work, spread over a time period of at least decennia, and requiring continual revaluation. When discussing world views, the metaphor of a building often comes to mind. The construction of world views can indeed be compared with an enterprise such as the construction of cathedrals in the Middle Ages. On a seemingly impossible task, generations have continued working, and sometimes the work never was finished. From time to time an overwhelming project collapses. The apparent impossibility of the task must not make us afraid. We believe that we must react against the current chaotic fragmentation of thought and that it is time for a new synthesis. We also must affirm that there is a great body of knowledge about which many people agree. It is a great miracle that during the course of the enormous struggle of mankind, we have been able to gain knowledge of the nature of this universe and the relation of our planet to the rest of the universe, that we have some insight into the evolution of the species, that 'such a thing' as theoretical physics is possible. In the philosophy of science and in system theory we can find concepts that make a far-reaching integration of different branches of the sciences possible. Also we see that a new view of man and human society is arising and that we have a responsibility to nature. It is not sufficient to limit ourselves to partial tasks, important as these specialised works may be. One has to

develop a methodology and a strategy, to realise sub-tasks, and to evaluate success and obstacles in function of broader purposes.

The attempt to construction of world views is a challenge for all the scientific world, because the specialising, differential trend in science still has the overhand. The 'world views' project is essentially complementary to this trend. It indicates the necessity of an effort towards integration and synthesis.

It seems that we can put forward some sober conclusions after all this. It is possible to start in a systematic way on world-view construction, and the results can be evaluated. Partial success is possible. Not all world views are equivalent and not every world-view construction is as sound as another one. Certainly one has to warn against the proliferation of 'wild' world views. There are many ingenious world models that, however, do not want to be submitted to empirical investigation, or do not take the technical terms of certain disciplines into account. This criticism can also be made of a sometimes premature synthesis of 'eastern' and 'western' thinking, or the extrapolation of insights from relativity theory of quantum mechanics, etc.

We propose to give an impulse to world view investigation starting with attempts that are already underway in the direction of the seven sub-tasks, and that preferably consider more than one of these sub-tasks. Here we should not only take into account the fashionable trends (the new physics, the uncertainty principle, etc.) but also give attention to traditional options from our own and from other cultures.

Meanwhile it has become clear that we envisage more than what a single group can attain. The project should be supported by a lasting institution, such as the V.Z.W. Worldviews, that should be able to depend on some financial resources to give the project the necessary stability. The importance of the problems concerned make it possible to find support from official authorities and from private sponsors. We do not have to wait till we can provide examples of world views. In conferences, lessons and publications we should put the concepts into practice that we have expressed in this statement of principles. This

text is meant as an invitation and encouragement to anyone who is ready to work with us.

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PART II

Projects

Proposal I: Invariants, Symmetries and Constants

'To understand' always means: to grasp the general in the particular. Philosophical and religious systems have always looked for the unchangeable and the essential. The sciences too look for universal laws, invariant relationships between varying factors. In our time, this search for constancy finds its main expression in the investigation of mathematical symmetries. The laws of motion, for instance, are invariant under translations and rotations of the coordinate-systems in which the quantities of motion are measured. We propose, using the theory of groups, to study — from mechanics and crystallography, to psychology, sociology, aesthetics and ethics, — the role and function of the most important symmetries.

Proposal II: Variation: The arrow of time

Irreversible change has drawn as much attention as invariance. In our time attempts are being made to construct a theory of irreversible change, often connected with the second law of thermodynamics. To the extent that Hegel's and Marx's dialectics have a foundation in reality itself, they belong to this trend of thought. We propose to look for a theory of irreversible change, applicable in various areas, from the physical to the human sciences.

Comment: Proposal I and II depart from basically different options (I has affinities with Parmenides, II with Heraclites). This exhibits the fundamental pluralism in method that the world views group adopts. We do not exclude the possibility that substance and process, symmetry and asymmetry, invariance and irreversibility can be thought of as features of one unified system. But neither do we reject a priori the hypothesis that either the theory of invariance or the idea of change have absolute priority in nature.

Proposal III: Unitary Theories

Since Einstein, theoretical physics has been seeking, with growing though not decisive success, a unified theory that would reduce all forces of nature to one type of force, to which matter itself would be reducible. The foundation of such a GUT (grand unified theory), or an — even more ambitious — TOE (theory of everything) is very specialized and technical, and yet also philosophical. More specifically, the major problem of the unification of relativity and quantum theory (or their replacement by others) can be seen as an episode in the secular confrontation — within all our world views — of the emphasis on continuity or discontinuity.

Proposal IV: Holisms

Reality is seen as a totality or as a plurality. Our contemporaries who stress totality, are known as 'holists.' Many holisms present themselves, both in science and in philosophy. Some are closer to biology (Gregory Bateson), others to physics (David Bohm). They ought not to be rejected off hand, but could — after analyses — be actualised and improved.

Proposal V: Pluralisms

We do not decide a priori in favour of unity however. Many thinkers envisage reality as an irreducible plurality of forms or processes. Therefore, we also propose to study the heterogeneity and novelty of the — possibly irreducible — parts and periods of reality. Even if our universe were a radical plurality as William James claims, it would still be worthwhile to spell out the form of this irreducible plurality.

Comment: Just as proposal I derives from a world view radically different from the one inspiring proposal II, in the same way, the basis of III and IV strongly differs from the foundation of V. We neither favour a priori dynamism nor statism, neither plurality nor unity, but we do stress the possibility and necessity of exposing, both scientifically and philosophically, the global dimensions of the different options.

Moreover, the two polarities (static dynamics, unity-multiplicity) intersect. Four different types of world views can already be distinguished.

Proposal VI: One and many systems

The nebula of theories brought together under the name 'systems theories,' involve a study of both continuous and discontinuous systems, both deterministic and indeterministic systems, both feedback and non-feedback systems. As such, this study has a powerful unifying potential. Systems theories are applied in engineering and operational research, in neurology and in oncology. They develop a number of very important concepts (system, subsystem, state, frontier environment, structure, complexity, equilibrium, stability, norm, model). We propose to investigate carefully the different meanings of these terms, in their application to various regions of reality. The status of system theory itself deserves attention (a useful vocabulary or a set of principles and theorems that have exploratory value). Is reality, considered as a whole, a system, and can its different sub-regions be characterised by the type of systematicity they favour?

Proposal VII: Fundamental Categories

We organise our reality in space and time. Within this spatio-temporal framework we distinguish aspects and events, related by causal and final relations, operating according to certain laws.

The comparative study of space, time, individuality, finality, causality, and legality in the various regions of reality, contributes to a general picture of reality as a whole.

Proposal VIII: Organisation and Self-Organisation. Cybernetics.

Cybernetics aims at the explanation of simple and complex retroactive systems. From the beginning it has aimed at the explanation of living and conscious systems as specific types of retroactive systems. This aim could not be reached until modelling within a complex retroaction of growth, evolution, learning and purposeful action became possible. These developments did occur. However, the various intelligence models, present in classical artificial intelligence, in neo-connectionism and in evolutionary neurology (Murray Edelman) are not yet completely integrated. Collections of interacting and learning cellular automata had to be studied. We propose the systematic study of the various models of intelligence, consciousness, self-consciousness, and purposeful action as forms of self-organisation. Are self-organisation and auto-poesis (Maturana and Varela) precise and fruitful concepts? When do retroactive systems become self-organising systems within a universe of systems? Can the universe as a whole be considered as a self-organising system?

Proposal IX: *Comparative study of Origins: Cosmogenesis, biogenesis, and anthropogenesis*

One may investigate empirically the origin of our universe, of life on earth and of the human species. One may also study empirically the evolution of the universe, life and mankind. These six enormous tasks being (very provisionally) undertaken, one may compare the three types of origin and the three types of evolution. Do they exhibit strong similarities or are they, to the contrary, radically different?

Thinking may be probability-statistic, or structural-algebraic, or geometrical-topological. What are the philosophical foundations of preferences in favour of one of these three methods? Does an option in favour of one of these three methods reflect itself in our views on the three origins and on the three evolutions, or is this not the case?

Proposal X: Topology of world views

Psychologists such as Karl Jaspers (*Psychologie der Weltanschauungen*) and Stephen Pepper, philosophers such as Wilhelm Dilthey, Hans Leisegang (*Denkformen*), Etienne Souriau (*De l'instauration philosophique*), and Martial Guéroult (*Dianoétique*), ethnologists such as Mary Douglas and in earlier periods Condillac and Renouvier, in their classifications of systems, have proposed ordered classifications of world views.

These many heterogeneous typologies have to be compared and integrated. Moreover, they can be applied!

Demographicists, ethnologists and sociologists may — empirically — discover fragments of world views in the behaviour of various communities. Methodologists and historians of science may — again empirically — discover fragments of world views in the methods as well as in the results of various sciences at various epochs.

The typology of world views may be applied to these discoveries in the history of science and in sociology. Doing this, it will be possible to show that practical life, scientific research, and philosophy often incorporate similarly structured world views. The mutual alienation of these endeavours will be overcome in the future.

Proposal XI: world views and Value Systems

Values are experienced in ethical, aesthetic and political action. Ethical systems, artistic styles, political movements and religious experiences presuppose convictions about reality, totality, their roots and their development. We propose the comparative study of the ontological presuppositions of our diverse value systems.

A. Ethics and world views.

Locke's ethics borrowed models from Newton's physics. Lucretius' ethics is unthinkable without Democritos' and Epicurus' atomistic philosophy of nature. Brentano and Scheler presuppose a form of Gestalt psychology. Kant's ethics is based on an analysis of human reason, Apel's and Habermas' ethics are based on theories about language and communication. We want to promote the comparative study of the ontological and anthropological presuppositions of our systems of ethics. Our purpose would be to investigate *which forms of ethics find their adequate ontological basis in the information we currently possess about man, society, history and the universe that surrounds us.*

B. The main political projects of this century have also been based on world views.

Communism and various types of socialism have developed in the prolongation of a dialectical materialism that cannot be separated from Hegel. Contractual liberalism, in the wake of market economy, presupposes the natural harmony of the invisible hand of the market. Various nationalisms (among them national socialism) are inspired by (doubtful) biological theories about species and social Darwinism. Present-day political ecology depends both on a science (ecology) and a world view (one of the many eco-sophies). We propose the study of the most influential political projects of the 20th century to examine their ontological scientific presuppositions with a view to the construction of political projects that take the most adequate and complete scientific information into account.

C. Art, science and philosophy interact with each other.

Do we see nature as a work of art? Do we see our work of art as models of our reality? We need both a systematic study of the influence exerted by changes in science and in world view on changes in art (and inversely) and a systematic study of structural similarities among the various arts, sciences and philosophies (without necessarily presupposing influence and interaction.)

D. Our values are also expressed in our religious and ideological systems.

Their ontological and scientific counterparts also have to be studied, in the same comparative spirit.

Preparations for the four undertakings we advocate, already exists. Our purpose however is to investigate the global meaning of nature, life and history as it manifests itself in ethical, political, artistic and religious aspirations, and to evaluate these aspirations with reference to the ontological and scientific adequacy of their presuppositions.

Proposal XII: Purposes and Extremality-Principles

Does physical, biological and sociological evolution exhibit finalities, or is the appearance of finality only an extrapolation of local developments? Does physics use the principle of minimal action and economy principles of profit maximalisation? Do non superficial affinities exist between both? Are variational expressions of physical law only compact ways of writing differential equations, or do they reveal fundamental insights? Could one use the concept of finality as a link between different system levels and as a means to integrate very different types of systems?

Proposal XIII: Nature and value

As humanity increases its impact on its environment, as it enlarges this environment, and as the same humanity acquires more and more power over itself, the species disturbs the equilibria in which it lives. Cultural and political movements try to restore earlier equilibria or to promote higher equilibria on a more global scale. Theoretical and applied ecology, including human ecology, offer a theoretical framework. New facts and theories have to be developed (a theory about the self-regulation of the global biosphere or the total planet is needed). New values are discovered (the intrinsic worth of non-human species and of physical landscapes). Old and new values enter into conflict with each other (ecocentrism versus anthropocentrism).

The development of integrated world views (relative to science, philosophy and values) is needed, offering a reasoned framework for environmental action and feeling.

Proposal XIV: Order or Chaos. Determinism or Indeterminism

Are the fundamental physical laws deterministic or should they be interpreted by means of stochastic processes? Deterministic and indeterministic interpretation of quantum mechanics, of evolution and of history confront each other, expressing in fact different world views.

One world view looks upon reality as basically chaotic and contingent. The regularities we observe around us are explained by it as the collective result of a multiplicity of random events.

The other world view, to the contrary, sees reality as a strongly ordered system. Its laws appear as conditions of the possibility of regularity as such. Randomness is only an illusion.

Between these extremes, many intermediary world views exist. Again (as in I and II), the two polarities intersect: an indeterministic cosmos is as possible as a deterministic one; a deterministic chaos is as conceivable as an indeterministic one.

We propose the systematic study of this problem in the different sciences, in axiology and in ontology.

Proposal XV: Consciousness and Group as Models of Reality.

The universe has been understood as a mechanism (materialistic mechanism) or as an organism (hylozoism, vitalism). Why not use acts of consciousness and groups as models of the whole? It is not necessary to reduce more complex systems to less complex ones, even though the 'inverse reduction' of the simple to the complex suffers from our lack of knowledge about collectivities and persons. Still, G.W.F. Leibniz looked upon the whole of reality as a set of 'monads,' more or less clearly conscious individual entities. A.N. Whitehead sees the universe as constituted by a set of occurrences, all having physical and mental features.

Models of consciousness and self consciousness, developed in cybernetics and the computer sciences, have to be compared to models of the same, originating in psychology *sui generis*. Theories looking upon the person as a knot in the lattice of structures (Levi-Strauss, Bourdieu), or as a collectivity of relatively autonomous modules (Marvin Minsky, Gerry Fodor), have to be compared with sociologies that present groups as representations of individual persons (Max Weber, Anthony Giddens, John Elster). These models, inspired by the new psychology and sociology, may give more concrete content to the Leibniz-Whitehead tradition.

Proposal XVI: world views and the History of Science

The workbench of theory and knowledge is the history of science. In the history of science, the world views of the investigators determine to a great extent the questions they ask, the hypotheses they take into account, the experiments they carry out and the weight they attribute to the verification or falsification of these hypotheses. A historical study of the interrelations between world views and the different features of inquiry, throws light on the present-day situation. Historical research will show what types of world views act as encouraging or restraining factors in problem situations of a given kind. By analogy, we may discover, confronted by our present-day scientific and social problem situation, the world views that have more potential than others for helping our present endeavours.

The different empirical disciplines that take the acclamation of knowledge as their object of study use world views as explanatory factors. The 'strong' hypothesis in sociology of science (see Stephen Woolgar and Bernard Bloor), makes science strongly dependant on social and cultural factors (among which world views are prominent). An evolutionary (Campbell, Popper) or genetic (Baldwin, Piaget) epistemology approaches knowledge acquisition as a search towards problem solving, analogous to the biological evolution of species. Again, a specific world view (generalised evolutionism) is the determining factor.

Economy and sociology of knowledge — using either a conflict or a harmony model of social interaction — see the knowing subjects as purposeful actors, trying to maximilise authority, power or control over production factors.

Large gaps exist between the empirical disciplines of science (just mentioned), and the normative ones (deductive and inductive, formal and informal logic and methodology of sciences). The decision to let these gaps exist, to deepen them, to the contrary, to overcome them depends on the relation between fact and norm, between being and value, between the knowing subject and actor, and the whole of reality. This means that it depends on one's world view.

Proposal XVII: Praxiology: Theory and Action

We have pre-reflexive intuitions about being and becoming, that we try to make precise in our sciences (see proposal I and II). Similarly, we have pre-reflexive intuitions about action. Every action is directed towards purposes, uses instruments and other means, transforms materials, departs from an initial state and runs through a series of intermediary stages (using information and energy) finally reaching results (that in success realise the purposes; that in failure do not realise them). Every action also produces non-intended and sometimes even counterproductive effects. A discipline, called 'praxiology' by its initiators, tries to find the most general laws valid for all action. Value criteria for all action are rationality and efficiency. Praxiology intends to make a comparative study of rationality and efficiency research on the environment, on plants and animals, on human beings and on societies.

Instead of the just mentioned deductive 'approach,' one might also try a more inductive one. How do the practioners of the different action sciences see themselves and their action? How do physicians think about the medical act, their own place (intellectual and social), and about their patients? How do their world views influence their medical behaviour? The same questions need to be asked about lawyers and magistrates, about politicians and administrators, about engineers and technicians. How do the practioners of the various action sciences (engineering, medicine, law, applied economics, politics) optimally interact, either in fact or ideally? How do they contribute specific information to our general world view?

In practice, one is continually obliged to act on the basis of incomplete, uncertain and even contradictory information. Our construction of world views finds itself in an analogous situation. We continually confront the unknown, the uncertain, and the impossibility of mastering the enormous quantities of information.

Can general decision theory help us in this field to delineate rational decision methods for solving ill-posed problems in semi-unknown environments?

Whoever looks at the action sciences, observes that the need for integration is very great, and the obstacles against it very powerful.

In medicine, large distances separate general practitioners from specialists, as well as the different specialisations of physiological, psychological and social medicine. Still, only an 'integrated medicine' can cure the global person.

In engineering, between mechanical and electrical engineering, between nuclear and classical engineering, between chemical and physical engineering, between production control, finance and promotion, the same gaps can be ascertained. Still, only an 'integrated engineering' can present an integrated product to a global environment and community.

In law, national and international, various courts and related functions (judges, lawyers, prison administrators and police) remain to a large extent strangers.

World view construction is not only, nor even mainly, the task of theoreticians. But we are very far from the integrated science of action we propose to encourage.

Proposal XVIII: The Control of Complexity

Present-day technical and scientific thought faces as one of its main challenges the control of the complexity of large-scale, many-part, heterogeneous systems. In the construction of world views one finds oneself confronted by similar difficulties. How can we hope to describe the very intricate, strongly connected real world in a sufficiently economical and perspicuous fashion? Do systems research and a hierarchical structural approach counterbalance sufficiently the reductionistic-analytic methods (that continue to be needed). Are very general methods borrowed from energetics also applicable outside of physics and technology?

Proposal XIX: The Dialogue of Language Games

Since Wittgenstein, Austin and Searle, we know that our language allows us to play many different language games, each having its own criteria of meaningfulness and validity. Describing, telling stories, deliberating, evoking legends and myths, writing poems are all activities that combine in different ways the denotative, performative, expressive, optative and imperative functions of language. Is it possible to talk about a myth, an art or a religion to a public that has no intimate connection with them, without distortion? The sciences of literature, theology and of mysticism can only develop to the extent that diversity in truth claims and truth conditions is realised. Still, it remains necessary to talk in a way that transcends the frontiers between the language games if one wants to avoid a schizoid disintegration of personality and culture. But how? How can one, using one language game, talk to a person using another one? How can one speak about the language game one is currently using (trying to develop *in* itself, its own meta-language game)?

These problems are encountered in the interaction between arts and styles, in the interaction among religions (and in the interaction between religions and non-religions).

Proposal XX: Models of the Future

Since the publication in 1971 of Jay Forester's *World Dynamics* and in 1972 of Meadows' (a.o.) *The Limits to Growth* and Leontiefs *The Future of the World Economy* (Oxford 1977), attention remains focused on quantitative methods in the forecasting of the future of humanity. Futurology is searching for a firm foundation. The models developed do not stress cultural and political variables. Moreover, they are not used to compare on their merits the various social, economical and political scenarios of the future. We propose an enrichment of these models in the general framework of views on world and mankind.

Proposal XXI: General Anthropology

In the human sciences, psychology and sociology vie with each other for supremacy. Against these hostile brothers (basing their explanations on conscious or / and unconscious motives, or on interpersonal relations, the biology of social relations) sociobiology and the neurology of psychic behaviour (neurosociology) proclaim their own supremacy. The traditional 'humanities' (linguistics, hermeneutical sciences, history and law) investigate man as a 'signifier', bearer of and producer of meaning. We propose the search for the unity of man (in his biological, historical, social and psychical nature).

Proposal XXII: In search of an integrated medicine

The medical sciences belong to praxiology. Contemporary Western medicine has selected as its quasi exclusive aspect the human body, and has applied the analytic scalpel of the anatomist to each aspect of the body fragmenting it into numerous parts. Marginal activities, like preventive medicine, behavioural medicine, and epidemiology do not belong completely to these trends. The fundamental sciences on which medicine is based, point towards fragmentation. The anatomist analyses the dead body and the biochemist eliminates the structure and investigates the chemical reactivity of its components. As a result of all these divisions, a multitude of dualisms appear: mind-body, individual-group, organ-organism. The acting physician, to the contrary, is confronted by a living total human being, as much by a network of serial relations and by a field of physical states as by a physical body. The fragmented sciences offer him only a partialised image of man and his world, preventing him from accepting the patient as a suffering totality. No obvious solutions exist for this predicament.

Ideas have been proposed by theoreticians in the fundamental sciences (Maturana and Varela for instance) and by praxiologists (LeShan and his *The Mechanic and the Gardener*). These attempts have remained isolated and marginal. An inventarisation of the existing attempts and a further elaboration of them is needed in collaboration with all actors involved in health care. Action sciences change more slowly than theoretical disciplines. An adequate model for integration should meet the needs of physicians, patients, and socio-political activists. It will require generations to develop.

Proposal XXIII: Psychiatry and our Image of Man

Psychiatry shows a facet of our being that usually remains hidden. Many so-called evident truths are revealed as errors. The clinical dialogue shows that many parents do not love their children but terrorize them, that sex is not always a source of joy but of anxiety and humiliation, and that socially successful people are not happy but often live in deepest depression. Not only the unsual stereotypes, but also many ethical and philosophical pictures of man appear as idealisations, behind which painful realities often remain undissolved. How should this dark side of man be understood?

An easy solution would be to consider the happy active individual as a norm and the neurotic as a deviant. But the psychic norm (in opposition to the physiological one) has no clear definition. Another easy solution (proposed by antipsychiatry) is to consider so-called 'neurotic' behaviour not as a deviant, but as a variant.

So-called "usual' and so called 'neurotic' behaviour, would be considered as of equal value. Is, however, psychosis or sexual crime nothing else than an alternative equivalent of usual behaviour?

The most desperate view would be to consider man as essentially violent and perverse with ethical rules functioning as instruments to regulate and modulate this innate violence. Only the psychiatrist would be aware of the hideous truth.

No single solution among these three is really satisfactory. We need to develop a concept of man that does not only take into account the polished exterior but that also explains (without making them obsolete) the hidden suffering and violence.

Conclusion: The Unity behind the various Proposals

The proposals intentionally point in many different directions. They show that the study of the whole can be encouraged, even by investigations that are not immediately directed towards the universe as such.

Some proposals are the generalisations of projects that are already under study in the various subdisciplines, but point towards a more encompassing world view. This is the case for the projects connected with invariants and symmetries, with the arrow of time, with unitarian theories in physics, with holisms, with order and chaos, with general anthropology. Other proposals express attempts towards integration that derive from more formal sciences (the projects connected with system theory, cybernetics and the theory of self-organisation belonging to this class). A third type of proposal originates in logic and methodology, looking for concepts that are used in many different disciplines and having a unifying momentum. The proposals connected with fundamental categories are of this style.

The former proposals remain on a theoretical level. However, we look for the unity of the universe in order to discover the meaning of life. Value problems, the relation of ethics, politics, action and reality cannot be avoided. The proposals connected with praxiology, psychiatry, the interaction of language games, the ontology of the various ethical, political and religious systems incorporate this need.

To be sure, the proposals listed should be differentiated and augmented. They do not cover the whole field of investigations that carry unifying promises. None of the proposals is sufficiently concrete to inspire practical work. All of them should be subdivided carefully, without losing however their underlying purpose (the development of views — plural — of totality, and of their interrelations among the different fields of enquiry).

One should never forget, while engaging in one of the many sub-tasks, how the whole is related to the seven features present in all world views that we have tried to explain in this monograph.

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